

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation	7/30/2013 2:38:06 PM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	PCB											
12												
13	General Statistics											
14	Total Number of Observations		33		Number of Distinct Observations		33					
15					Number of Missing Observations		0					
16	Minimum		0.598		Mean		6.672					
17	Maximum		47.98		Median		3.372					
18	SD		9.993		Std. Error of Mean		1.74					
19	Coefficient of Variation		1.498		Skewness		3.022					
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic		0.562		Shapiro Wilk GOF Test							
23	5% Shapiro Wilk Critical Value		0.931		Data Not Normal at 5% Significance Level							
24	Lilliefors Test Statistic		0.341		Lilliefors GOF Test							
25	5% Lilliefors Critical Value		0.154		Data Not Normal at 5% Significance Level							
26	Data Not Normal at 5% Significance Level											
27												
28	Assuming Normal Distribution											
29	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
30	95% Student's-t UCL		9.619		95% Adjusted-CLT UCL (Chen-1995)				10.51			
31					95% Modified-t UCL (Johnson-1978)				9.771			
32												
33	Gamma GOF Test											
34	A-D Test Statistic		2.202		Anderson-Darling Gamma GOF Test							
35	5% A-D Critical Value		0.776		Data Not Gamma Distributed at 5% Significance Level							
36	K-S Test Statistic		0.22		Kolmogrov-Smirnoff Gamma GOF Test							
37	5% K-S Critical Value		0.158		Data Not Gamma Distributed at 5% Significance Level							
38	Data Not Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41	k hat (MLE)		0.988		k star (bias corrected MLE)		0.919					
42	Theta hat (MLE)		6.752		Theta star (bias corrected MLE)		7.264					
43	nu hat (MLE)		65.22		nu star (bias corrected)		60.63					
44	MLE Mean (bias corrected)		6.672		MLE Sd (bias corrected)		6.962					
45					Approximate Chi Square Value (0.05)		43.72					
46	Adjusted Level of Significance		0.0419		Adjusted Chi Square Value		42.98					
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50))		9.252		95% Adjusted Gamma UCL (use when n<50)		9.412					
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic		0.938		Shapiro Wilk Lognormal GOF Test							
53	5% Shapiro Wilk Critical Value		0.931		Data appear Lognormal at 5% Significance Level							
54	Lilliefors Test Statistic		0.146		Lilliefors Lognormal GOF Test							
55	5% Lilliefors Critical Value		0.154		Data appear Lognormal at 5% Significance Level							
56	Data appear Lognormal at 5% Significance Level											
57												
58	Lognormal Statistics											
59	Minimum of Logged Data		-0.514		Mean of logged Data		1.313					
60	Maximum of Logged Data		3.871		SD of logged Data		0.994					
61												
62	Assuming Lognormal Distribution											

	A	B	C	D	E	F	G	H	I	J	K	L
63					95% H-UCL	9.336					90% Chebyshev (MVUE) UCL	9.529
64					95% Chebyshev (MVUE) UCL	11.14					97.5% Chebyshev (MVUE) UCL	13.39
65					99% Chebyshev (MVUE) UCL	17.79						
66												
67	Nonparametric Distribution Free UCL Statistics											
68	Data appear to follow a Discernible Distribution at 5% Significance Level											
69												
70	Nonparametric Distribution Free UCLs											
71					95% CLT UCL	9.534					95% Jackknife UCL	9.619
72					95% Standard Bootstrap UCL	9.493					95% Bootstrap-t UCL	12.12
73					95% Hall's Bootstrap UCL	11.1					95% Percentile Bootstrap UCL	9.7
74					95% BCA Bootstrap UCL	10.82						
75					90% Chebyshev(Mean, Sd) UCL	11.89					95% Chebyshev(Mean, Sd) UCL	14.25
76					97.5% Chebyshev(Mean, Sd) UCL	17.54					99% Chebyshev(Mean, Sd) UCL	23.98
77												
78	Suggested UCL to Use											
79					95% H-UCL	9.336						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulation results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												
86	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.											
87	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.											
88	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
89	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution											
90												